

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **072015-005** Project Number: 2014-07-042

Installation Number: 047-0007

Parent Company: USG Corporation

Parent Company Address: 500 West Adams Street, Chicago, IL 60661

Installation Name: United States Gypsum Company

Installation Address: 1115 Armour Road, North Kansas City, MO 64116

Location Information: Clay County, S13, T50N, R33W

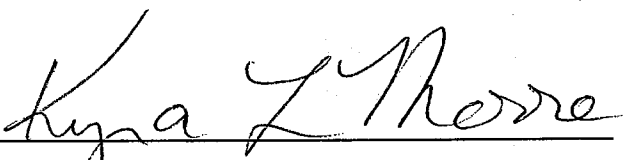
Application for Authority to Construct was made for:  
Boiler EP-01 burner replacement. This review was conducted in accordance with Section (5),  
Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

☐ Standard Conditions (on reverse) are applicable to this permit.

☒ Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JUL 10 2015

EFFECTIVE DATE

  
\_\_\_\_\_  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Permit No.	
Project No.	2014-07-042

# SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

United States Gypsum Company  
Clay County, S13, T50N, R33W

1. Operational Requirement - Fuel Type
  - A. United States Gypsum Company shall combust exclusively pipeline grade natural gas in the boiler (EP-01).
  - B. United States Gypsum Company shall keep fuel usage and supplier certification records from each billing cycle.
2. Record Keeping and Reporting Requirements
  - A. United States Gypsum Company shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.
  - B. United States Gypsum Company shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2014-07-042  
Installation ID Number: 047-0007  
Permit Number:

United States Gypsum Company  
1115 Armour Road  
North Kansas City, MO 64116

Complete Date  
of Application: February 3, 2015

Parent Company:  
USG Corporation  
500 West Adams Street  
Chicago, IL 60661

Clay County, S13, T50N, R33W

REVIEW SUMMARY

- United States Gypsum Company has applied for authority to replace the burner in boiler EP-01.
- HAP emissions are expected from the proposed equipment. HAPs are from natural gas combustion in the boiler. The papermaking process emits HAPs, but there is not an increase associated with this project.
- 40 CFR 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, applies to the boiler. The boiler is solely natural gas fired.
- 40 CFR 60 Subpart BB, *Standards of Performance for Kraft Pulp Mills*, does not apply. The installation is not a pulp kraft mill.
- None of the NESHAPs under 40 CFR 61 apply to the proposed equipment.
- None of MACTs under 40 CFR 63 apply to the proposed equipment. 40 CFR 63 Subpart JJJJJJ, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, does not apply because the boiler meets the definition of gas-fired.
- 40 CFR 63 Subpart S, *National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry*, does not apply. The installation is not a major HAP source.
- 40 CFR 63 Subpart MM, *National Emission Standard for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills*, does not apply. The installation is not an applicable pulp mill or a major HAP source.

- A cyclone is being used to control the PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions from the paper trim cutter EP-06. There is no increase in trim cutter MHDR for this project. The cyclone is for product recovery, not an add-on control device.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of the project are below de minimis levels. Potential emissions of the project were calculated using “potentials minus actuals”. Project emissions exceed the insignificant emission exemption levels in 10 CSR 10-6.061(3)(A)3., requiring a permit.
- This installation is located in Clay County, a maintenance area for ozone and an attainment area for all other criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- Submittal of a Basic Operating Permit application is required for this installation within 30 days of the new burner's startup. An operating permit is required due to NSPS Dc.
- Approval of this permit is recommended with special conditions.

## INSTALLATION DESCRIPTION

United States Gypsum Company (USG) manufactures paper facing for drywall. Waste paper is received, mixed with water and other raw materials, formed, dried, trimmed, and shipped off-site. Process heat is provided by a natural gas fired boiler. In the past USG has been a minor source under construction permits and a major source under operating permits. Most recently USG has held a basic operating permit. This construction permit recalculated the installation-wide PTE to show USG is now a de minimis source under construction permits. The following New Source Review (construction) permits have been issued to USG from the Air Pollution Control Program. Both permits were issued in the early 1980s. Calcium carbonate and starch processes in permits 0882-001A, 0882-002A, and 0882-003A have been dismantled or taken out of service.

Table 1: Permit History

Permit Number	Description
0181-001	Paper trim cutter
0882-001A, 0882-002A, 0882-003A	Calcium carbonate storage, starch handling

## PROJECT DESCRIPTION

USG proposes to replace the existing burner in boiler EP-01. The new burner, with an MHDR of 91.28 MMBtu/hr fuel input, is larger than the existing burner. The boiler supplies heat for the papermaking process. The burner is being replaced because in cold weather the useable heat is reduced and the papermaking process is slowed. The new burner is a Variflame model 565 and will be fired exclusively with natural gas. The new burner will not debottleneck the papermaking process because other bottlenecks exist at the machine drive speed, stock preparation, refining, forming and pressing, drying, and finishing. Modifications to other processes, including but not limited to those in the previous sentence, are subject to permitting applicability.

USG requested confidentiality for the papermaking chemical names and usage, and it was granted. A confidential file was created under project 2014-07-079 for the emission calculations. This is the public permit version. A confidential permit is not being issued as the chemical names and their usage can be withheld without compromising the permit discussion.

Emissions from the paper trim cutter EP-06 are controlled by a cyclone, which is not changing. Permit 0181-001 did not explicitly require the cyclone. This permit also does not require the cyclone as an add-on control device. The cyclone is for product recovery. Emissions reductions are considered without a special condition requiring the cyclone to be operated.

Calendar exhaust EP-13 is equipped with a scrubber according to project 2014-04-059. However since no permit was required for that project, and no other air regulations require its operation, then the scrubber is not federally enforceable. No emission reductions from the scrubber operation were considered in this permit. There are no papermaking emission increases associated with this project.

## EMISSIONS/CONTROLS EVALUATION

### Project PTE

The emission factors for the burner replacement were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Natural Gas Combustion, Section 1.4, July 1998. The manufacturer claimed the burner is low NO<sub>x</sub>. However, the manufacturer NO<sub>x</sub> emission factor was significantly higher than the AP-42 low NO<sub>x</sub> factor, and just slightly less than the AP-42 standard NO<sub>x</sub> factor. Therefore the AP-42 standard NO<sub>x</sub> factor was chosen. The other supplied emission factors were also close to the AP-42 standard factors, and the AP-42 standard factors were chosen. GHG calculations were performed using 40 CFR 98. Baseline actual gas consumption was provided by the applicant. Baseline actual emissions were not obtained from the installation's EIQ because the installation is a small EIQ source that has been subject to reduced reporting.

The boiler is not equipped with a wet cooling tower. Boiler blowdown is infrequent, and after review of the boiler water additives the emissions were considered negligible.

#### Remainder of the Installation PTE

Emissions from stock preparation (EP-10) include VOC and HAPs from the chemicals added to the process. Emissions were calculated using mass balance assuming 100 percent emitted at this papermaking step. VOC and HAP content were obtained from confidential MSDS. Potential chemical usage was calculated using applicant provided material usage and paper production rates from 2007 to 2014. Maximum potential paper production was divided by maximum actual paper production. This value was multiplied by each raw material to determine their individual MHDR.

The papermaking chemicals contain the HAPs acrylamide, ethylene oxide, and 1-4 dioxane. Changes in papermaking chemicals after this permit's issuance are subject to construction permit applicability.

Papermaking machine emission factors were obtained from the National Council for Air and Stream Improvement (NCASI) technical bulletin 884, Table E1, PMB corrugating medium. The emission factor is 0.0205 pounds of filterable PM per air dried ton of product. Conservatively the emission factor was applied to PM<sub>10</sub> and PM<sub>2.5</sub>.

Emissions from the trim cutter (EP-06) were calculated using SCC 3-07-008-02 for log sawing. The SCC does not show an emission factor for PM<sub>2.5</sub>. PM<sub>2.5</sub> was assumed 50 percent of PM<sub>10</sub>. It was not assumed to equal PM<sub>10</sub> because when the cyclone control efficiency is applied, PM<sub>2.5</sub> emissions would be greater than PM<sub>10</sub> emissions. The cyclone control efficiencies of 31.72 and 10.49 percent for PM<sub>10</sub> and PM<sub>2.5</sub> respectively, were obtained from the 2002 and 2003 EIQ. The values are in proximity to the efficiencies assigned to a low-efficiency centrifugal collector in AP-42 Table B.2-3. Capture efficiency was assumed 100 percent via pneumatic transport.

Emissions from the parts washers (EP-12) were calculated using the solvent MSDS. The solvent is 100 percent VOC with trace amounts of volatile HAPs. Any lids or covers were not considered control devices for PTE purposes as the PTE was calculated based upon solvent usage.

Haul road emissions (EP-14) were calculated using AP-42 Section 13.2.1, Paved Roads, January 2011.

Hydrogen sulfide and other volatile sulfur emissions are typically associated with papermaking wastewater. However, since the installation does not make paper through the kraft process these emissions were considered negligible.

Table 2 provides an emission summary. Existing potential emissions were not calculated. Existing actual emissions were taken from the installation's 2014 EIQ, however only the stock preparation VOC and boiler were reported in the EIQ. Potential emissions of the project represent the potentials minus actuals of the boiler. PTE of the boiler is below de minimis without considering actuals. Potential emissions of the installation represent the boiler PTE, papermaking, trim cutter, parts washers, and haul roads.

Table 2: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Project (Boiler PTE - BAE)	Installation PTE
PM	25.0	N/D	0.54	4.29
PM <sub>10</sub>	15.0	0.85	2.14	4.78
PM <sub>2.5</sub>	10.0	0.85	2.14	4.35
SO <sub>x</sub>	40.0	0.07	0.17	0.24
NO <sub>x</sub>	40.0	11.21	28.19	39.20
VOC	40.0	14.10	1.55	36.91
CO	100.0	9.41	23.68	32.93
GHG (mass)	250.0	N/D	33,825.32	47,037.81
GHG (CO <sub>2</sub> e)	100,000	N/D	34,025.05	47,315.56
Combined HAPs	25.0	N/D	0.53	0.80
Hexane	10.0	N/D	0.51	0.71
Acrylamide	0.02	N/D	N/A	0.05

N/A = Not Applicable; N/D = Not Determined

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of the project are below de minimis levels.

### APPLICABLE REQUIREMENTS

United States Gypsum Company shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165



## SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
  - Boiler EP-01 is exempt as the burning of fuel for indirect heating
  - Haul roads EP-14 are exempt as fugitive emissions
  - Trim cutter EP-06 and the Papermaking Machine are individually exempt as having a PM PTE less than 0.5 pounds per hour at maximum capacity
- *New Source Performance Regulations*, 10 CSR 10-6.070
  - *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Dc
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405. The boiler solely combusts natural gas. Other emission units combust fuels in 10 CSR 10-6.405(1)(E), and the installation is exempt from this rule.
- *Control of Emissions from Solvent Metal Cleaning*, 10 CSR 10-2.210

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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David Little, PE  
Environmental Engineer III

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Date

## PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated July 17, 2014, received July 21, 2014, designating USG Corporation as the owner and operator of the installation.

The following documents are permit references:

- National Council for Air and Stream Improvement, technical bulletin 884.
- EPA, *AP-42 Compilation of Air Pollutant Emission Factors*, Fifth Edition.

## APPENDIX A

### Abbreviations and Acronyms

<b>%</b> ..... percent	<b>m/s</b> ..... meters per second
<b>°F</b> ..... degrees Fahrenheit	<b>Mgal</b> ..... 1,000 gallons
<b>acfm</b> ..... actual cubic feet per minute	<b>MW</b> ..... megawatt
<b>BACT</b> ..... Best Available Control Technology	<b>MHDR</b> ..... maximum hourly design rate
<b>BMPs</b> ..... Best Management Practices	<b>MMBtu</b> ..... Million British thermal units
<b>Btu</b> ..... British thermal unit	<b>MMCF</b> ..... million cubic feet
<b>CAM</b> ..... Compliance Assurance Monitoring	<b>MSDS</b> ..... Material Safety Data Sheet
<b>CAS</b> ..... Chemical Abstracts Service	<b>NAAQS</b> ..... National Ambient Air Quality Standards
<b>CEMS</b> ..... Continuous Emission Monitor System	<b>NESHAPs</b> National Emissions Standards for Hazardous Air Pollutants
<b>CFR</b> ..... Code of Federal Regulations	<b>NO<sub>x</sub></b> ..... nitrogen oxides
<b>CO</b> ..... carbon monoxide	<b>NSPS</b> ..... New Source Performance Standards
<b>CO<sub>2</sub></b> ..... carbon dioxide	<b>NSR</b> ..... New Source Review
<b>CO<sub>2e</sub></b> ..... carbon dioxide equivalent	<b>PM</b> ..... particulate matter
<b>COMS</b> ..... Continuous Opacity Monitoring System	<b>PM<sub>2.5</sub></b> ..... particulate matter less than 2.5 microns in aerodynamic diameter
<b>CSR</b> ..... Code of State Regulations	<b>PM<sub>10</sub></b> ..... particulate matter less than 10 microns in aerodynamic diameter
<b>dscf</b> ..... dry standard cubic feet	<b>ppm</b> ..... parts per million
<b>EQ</b> ..... Emission Inventory Questionnaire	<b>PSD</b> ..... Prevention of Significant Deterioration
<b>EP</b> ..... Emission Point	<b>PTE</b> ..... potential to emit
<b>EPA</b> ..... Environmental Protection Agency	<b>RACT</b> ..... Reasonable Available Control Technology
<b>EU</b> ..... Emission Unit	<b>RAL</b> ..... Risk Assessment Level
<b>fps</b> ..... feet per second	<b>SCC</b> ..... Source Classification Code
<b>ft</b> ..... feet	<b>scfm</b> ..... standard cubic feet per minute
<b>GACT</b> ..... Generally Available Control Technology	<b>SDS</b> ..... Safety Data Sheet
<b>GHG</b> ..... Greenhouse Gas	<b>SIC</b> ..... Standard Industrial Classification
<b>gpm</b> ..... gallons per minute	<b>SIP</b> ..... State Implementation Plan
<b>gr</b> ..... grains	<b>SMAL</b> ..... Screening Model Action Levels
<b>GWP</b> ..... Global Warming Potential	<b>SO<sub>x</sub></b> ..... sulfur oxides
<b>HAP</b> ..... Hazardous Air Pollutant	<b>SO<sub>2</sub></b> ..... sulfur dioxide
<b>hr</b> ..... hour	<b>tph</b> ..... tons per hour
<b>hp</b> ..... horsepower	<b>tpy</b> ..... tons per year
<b>lb</b> ..... pound	<b>VMT</b> ..... vehicle miles traveled
<b>lbs/hr</b> ..... pounds per hour	<b>VOC</b> ..... Volatile Organic Compound
<b>MACT</b> ..... Maximum Achievable Control Technology	
<b>µg/m<sup>3</sup></b> ..... micrograms per cubic meter	

Mr. Chris Hansen  
Engineering Manager  
United States Gypsum Company  
1115 Armour Road  
North Kansas City, MO 64116

RE: New Source Review Permit - Project Number: 2014-07-042

Dear Mr. Hansen:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, Missouri 65102, website: [www.oa.mo.gov/ahc](http://www.oa.mo.gov/ahc). If you have any questions regarding this permit, please contact David Little, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:dll

Enclosures

c: Kansas City Regional Office  
PAMS File: 2014-07-042  
Permit Number: